



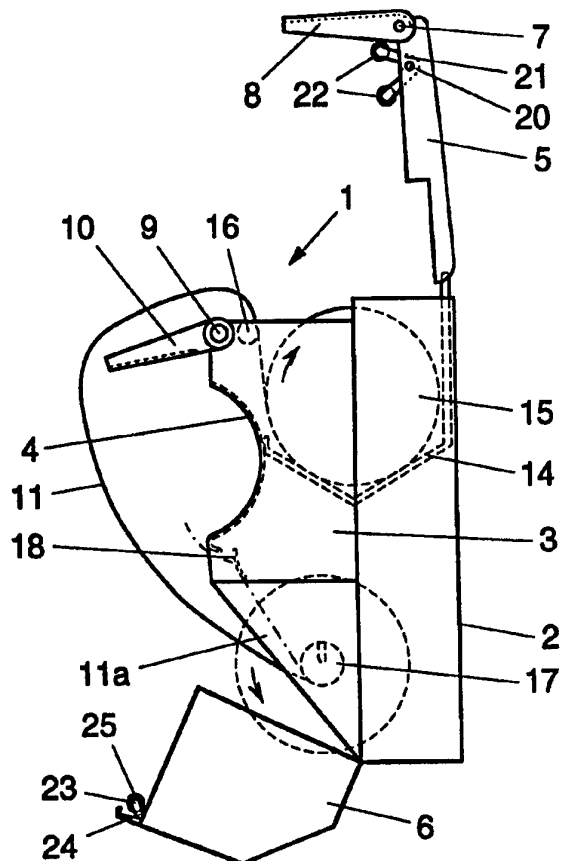
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(54) Title: TOWEL DISPENSER

(57) Abstract

Towel dispenser comprising a housing having a tubular frame part (1) and cover parts (5, 6), while adjacent a transition at the front side between the frame part and the flap parts, a towel slot (12, 13) is in each case present, which housing contains a first space for clean towel web (11) and a second space for used towel web, wherein the towel web runs, via the first and second slots, from the first space to the second space and passes a set of feed rollers (16) which are coupled to an energy accumulator (33) which, controlled by a delay mechanism, operate a take-up shaft, and wherein means are further present for enabling used towel web to be partially retracted from the second slot and taken into it again, wherein, after the opening of the flap parts, a clean towel web can be placed without threading actions.



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Title: Towel dispenser

The invention relates to a towel dispenser comprising a housing with a frame part having a back plate which can be mounted on a wall, two side plates and a front plate connecting the side plates, wherein back plate, side plates  
5 and front plate give the frame part a tubular shape with open ends, and cover parts which are connectable to the frame part and which can close at least the open ends of the tubular frame part, wherein adjacent a transition between the front plate and each of the two cover parts a slot is present for  
10 letting through a towel web, which slots extend parallel to each other and are spaced apart, which housing is provided with a first space for receiving a stock of clean towel web and with a second space for receiving used towel web, wherein the towel web can extend via the first and the second slot  
15 from the first space to the second space while running, between the first space and the first slot, between a set of feed rollers, at least one of these feed rollers being coupled to a transmission mechanism which can charge an energy accumulator, such as a spring motor, which energy accumulator,  
20 controlled by a delay mechanism, can rotate a take-up shaft in the second space for taking in used towel web, and wherein means are further present for enabling used towel web to be partially retracted from the second slot and taken into it again.

25 Such towel dispenser is known from EP-A1-0 309 208. For fitting a stock of clean towel web, the roll is placed in a receiving space, after which the leading end of the web of towel material should first be passed from the inside between the feed rollers and pulled. Then, the leading end should be  
30 threaded through the first and second slots provided in the front plate. After having passed the second slot, the towel web should be passed over and along six rollers, while an elongated loop is formed.

The loop thus formed provides the possibility of  
35 temporarily retracting used towel web from the second slot, due to the fact that the roll forming one end of the loop is

displaceably arranged. When used towel web is being pulled out, the elongated loop is shortened through displacement of the roll. If the pull-out force is removed, gravity provides that the roll returns into its starting position again and thus takes in the used towel web that was previously pulled out.

The pulling out and taking in again of used towel web promotes a hygienic and at the same time convenient use of the towel dispenser. However, this means that for pulling out a length of towel web sufficient for enabling drying of the hands, the location where the towel web is engaged should be shifted several times during pulling out, because the distance between the points of engagement and the second slot partly determines the length of clean towel web that can be pulled from the first slot at once without taking over or letting the towel web slip. Taking over or letting slip can be avoided by causing used towel web to come back from the second slot during the pull-out movement. To prevent the hands from contacting, during drying, that used part of the towel web, that part should be taken in again directly after completion of the pull-out movement.

After the formation of an elongated loop during the fitting of a roll of clean towel web, the end of the towel web should be wound some turns around the take-up shaft accommodated in the second space.

All in all, the fitting of a new stock of towel web is a labor-intensive and time-consuming affair, which moreover requires some insight into the operation of the towel dispenser in order to fit the towel web in the required manner. The fitting of the towel web between the feed rollers and through the slots requires some patience. If the pulling out and taking in again of used towel web is to take place correctly, the elongated loop should be properly formed. Finally, the end of the towel web should be wound on the take-up shaft in the proper direction, to prevent the end from being turned loose again upon first use.

US-A-3,574,431 discloses a towel dispenser wherein a stock roll to be placed in a top compartment closable by a first cover part abuts against a feed roller which is fixedly mounted in the frame, and wherein a roller mounted in a cover part presses the towel web against the feed roller when the cover part is closed. Via a chain, the feed roller directly drives a take-in roller which rotates faster and which is fixedly disposed in a bottom compartment closable by a second cover part. To permit slipping, a take-up roller on which used towel material is wound rests freely rotatably on the take-in roller. In the bottom compartment, the towel web is threaded underneath a pull-in bracket, then over a stationary shaft and then through the nip between the take-in roller and the take-up roller, before it is connected to the take-up roller. In this manner, in this towel dispenser, too, the fitting of a new roll of clean towel material is a laborious operation requiring proper attention and knowledge of the apparatus.

The object of the invention is to improve a towel dispenser of the type described in the opening paragraph so that it can be filled easily and quickly, also by personnel not trained therefor, while, moreover, the amount of towel web used per drying operation is kept as slight as possible and hygiene is served optimally.

To that end, in accordance with the invention, it is proposed that the first and the second slot are always formed between a cover part and the front plate of the frame part, that at least one of the feed rollers is mounted in the frame part and at least one other feed roller is mounted in a first cover part closing the first space, and that in the frame part a guide part is mounted and in a second cover part closing the second space a take-in roller is mounted, wherein the towel web, when being introduced into the towel dispenser, can be placed from the first space over the feed roller or feed rollers mounted in the frame part and then on the outside along the guide part, whereupon, when the first cover part is being closed, the feed rollers come to lie relative to each other so that the towel web is held in close contact with at

least one of the feed rollers which, via the energy accumulator, drives the transmission mechanism coupled to the take-up shaft, and when the second cover part is being closed, the guide part and the take-in roller form a slot through  
5 which the towel web will extend automatically.

Through these features, a new stock of clean towel web can be placed in the towel dispenser in an extremely simple manner and with only a slight chance of mistakes. After all, when the towel dispenser is opened through displacement of the  
10 cover parts, the first slot and the nip between the feed rollers are simultaneously increased so that at once, the entire stock of towel web can be introduced therethrough. In other words, reaching through the increased first slot and nip between the feed rollers, a new stock of towel web is placed  
15 in the first space, whereupon the end of the towel web is retracted again along the same way. Also, after the relevant cover has been swung open, the second slot and the slit between the guide part and the take-in roller is likewise increased to allow the web to be passed therethrough without  
20 any problems in order to connect the end of the towel web to the take-up shaft, while the curved guide surface of the take-in roller in particular causes the withdrawing of used towel web to take place in a supple manner. The fitting operation can then be completed simply by bringing the two covers into  
25 the closing position.

Because the pulled-out towel web has to charge an energy accumulator via a roller by driving that roller in rotation, it should be provided that this roller does indeed rotate during displacement of the towel web. Driving the roller by  
30 means of the towel web suchwise is surrounded with more guarantees if, in accordance with a further embodiment of the invention, a set of rollers consists of a first roller and two rollers which are displaceable relative to the first roller during the opening of a cover part, which have parallel center  
35 lines and which are straddled on the first roller when that cover part is closed, so that a towel web running between the rollers is forced to be in contact with a part of the

circumference of each roller. This effect can further be improved if the two jointly moving rollers are mounted in a yoke having a pivot parallel to the center lines of those two rollers. Any plays or tolerances can then be taken up in a simple manner.

The convenience during the fitting of a new stock of towel web can further be increased if, in accordance with a further embodiment of the invention, the cover parts are pivotally connected to the frame part, in each case by means of a pivot extending parallel to the first and second slots.

It has been observed hereinabove that mistakes may occur during connecting the end of a towel web to the take-up shaft. This can be prevented in a particularly effective manner if, in accordance with a further embodiment of the invention, the take-up shaft is provided with a slot extending over at least the width of the towel web, into which slot the towel web can be slid from aside and which comprises means retaining a slid-in towel web by means of friction. Through these features, it is no longer necessary during the fitting of a new stock to wind a certain length of towel web around the take-up shaft in one direction or the other, so that it can no longer cause any mistakes being made either.

In the known prior art, the take-up shaft is driven by a stationary shaft which is drivable by the energy accumulator to be charged by means of the feed rollers and which contacts the towel web wound on the take-up shaft. The take-up shaft is movably supported in bearings, to enable ensuring that the desired contact is maintained when the diameter increases through wound-up used towel web material. A take-up shaft having an end of the towel web slid into it can be less suitable for being driven by such a roller. For that reason, in accordance with a further embodiment of the invention, it is preferred that the take-up shaft be directly drivable by the energy accumulator to be charged by means of the feed rollers. This solution has the further advantage that instead of two shafts, now only one shaft is present.

In that case, that one shaft should actually be drivable as well as detachable. In accordance with the invention, this can be realized in an advantageous manner if the take-up shaft is at one end thereof provided with an insert journal having  
5 such a shape that through insertion, a moment-transmitting connection can be formed with an element drivable in rotation by the energy accumulator, whilst the take-up shaft is at its other end provided with an insert journal which can be inserted into a bearing that can be swivelled or pulled away.

10 As mentioned hereinabove, from the point of view of hygiene it is preferred that the distance between the first and the second slot is as small as possible, because then, in the waiting position of the towel dispenser, the visible, directly touchable part of the towel web is as small as  
15 possible. This part can be reduced further if in accordance with a particularly preferred embodiment of the invention, a flap is provided connecting to the first slot and pivotable adjacent that first slot, which flap comprises a first part connected to the first cover part and a second part connected  
20 to the frame part, whilst the towel web can extend between the two flap parts and the first flap part can be coupled to the second flap part, and the second flap part is pressed into an inclined swivelled-out position by a spring force, which spring force is less than the force generated by the energy  
25 accumulator driving the take-up shaft.

After use of the towel dispenser, the take-up shaft driven by the energy accumulator will take in the towel web and pull it taut between the first and the second slot. Although the flap is arranged for springing outwards, a proper  
30 choice of the spring forces will cause the flap to be pulled along so that this flap, too, will be directed from the first to the second slot. Consequently, in the waiting position, the length of free towel web has been reduced. When a new length of clean towel web is being pulled out, a wider loop is formed  
35 and the flap will be able to swivel out. Together with the recess formed in the front plate, the flap produces a greater manoeuvring space during the drying of the hands, which,

compared with a situation without flap, is greater to the extent that with flap the length of towel web to be pulled out can be smaller than without flap. In this manner, the flap has a double advantage, viz. reduction of the free length of towel web in the waiting position and reduction of the necessary length of clean towel web to be pulled out. The use of such towel web becomes possible, at least so in a useful manner, through the particular construction of the towel dispenser according to the invention. After all, having to slide the leading end of the towel web through the narrow flap opening having a passage which is almost equal to the cross section of the towel web would be an almost impossible task in view of the slight stability of form of the towel web. However, by also increasing the passage of the flap in conformity with the increase of the passage of the two slots and the nip between the relevant rollers also when the towel dispenser is being opened, the fitting of a new stock of towel web remains possible in a quick and simple manner, with a slight danger of making mistakes, inspite of the presence of the flap.

Because of the two-part construction of the flap, it should be provided that in the waiting position, also the flap part resting outside on the towel web remains directed in the same direction as the towel web. For that purpose, the two flap parts are coupled, yet this coupling should preferably be so that during the opening of the towel dispenser, that coupling is broken without any additional operations. This can be realized in a simple manner if the coupling between the two flap parts takes place by means of a magnetic force. It is also possible that the first flap part is pressed in the direction of the other flap part by gravity or by a spring force, this force being less than the spring force that tries to cause the second flap part to swivel out.

With reference to an exemplary embodiment shown in the drawings, the towel dispenser according to the invention will presently be further described and explained. In these drawings:

Fig. 1 shows the towel dispenser in front view with a towel web pulled taut;

Fig. 2 shows a side elevation of Fig. 1;

Fig. 3 shows the towel dispenser in side elevation, with  
5 a towel web pulled out in the form of a loop;

Fig. 4 shows the towel dispenser in side elevation in folded-upen position;

Fig. 5 schematically shows the internal mechanism of the towel dispenser in perspective;

10 Fig. 6 shows a take-up shaft in elevation; and

Fig. 7 shows a section taken on line VII-VII in Fig. 6.

The towel dispenser shown in Figs. 1 and 2 comprises a frame part 1 composed of a back plate 2, two side plates 3 and a front plate 4. The frame part 1 is closable at the top by  
15 means of a top cover 5 and at the bottom via a bottom cover 6. An outer flap part 8 is provided on the top cover 5 for pivoting about a shaft 7, while, as may appear most clearly from Fig. 4, the frame part 1 carries an inner flap part 10 for pivoting about a shaft 9. The flap parts together form a  
20 passage for a towel web 11 which, from a space in the top part of the towel dispenser and via a first slot 12 between the top cover 5 and the front plate 4, enters the passage between the flap parts 8 and 10, leaves this passage on the opposite side and runs, via a second slot 13 between the front plate 4 and  
25 the bottom cover 6, towards a space in the bottom part of the towel dispenser.

Fig. 2 shows the towel dispenser in a waiting position ready for use. The towel web 11 is pulled taut, so that it extends from the first slot 12 to the second slot 13 as  
30 straight as possible. In the waiting position, the inner flap part 10, which is arranged for swivelling out via spring means not shown, is pulled into an almost vertical position by the towel web 11, as is shown in Fig. 2. By the action of gravity or by magnetic means not shown, the outer flap part 8 has  
35 followed the inner flap part 10 into the almost vertical position.

If the towel dispenser has to be used, the towel web 11 is manually pulled outwards to form an wide, easily accessible loop for drying the hands, partly because of the flap parts 8 and 10 then swivelling out, as shown in Fig. 3.

5 From Fig. 4, showing the towel dispenser in an open position allowing removal of a used stock of towel web and placement of a new stock of clean towel web, it appears that in the top part of the frame part 1 a trough 14 is provided forming a receiving space for a stock of clean towel web. That  
10 stock is shown in the form of a roll 15. It is observed that this may as well be a towel web which is for instance folded zigzag. In practice, a textile towel web is often rolled up, while a paper towel web is typically folded zigzag. This, too, should not be interpreted as a limitation: a zigzag-shaped  
15 towel web is just as much possible as a rolled-up paper web.

For inserting a new stock of towel web into the dispenser, the roll 15 is placed in the trough 14, after which the end of the towel web 11 is pulled over a feed roller 16 mounted in the frame part 1. Then, the towel web 11 is passed  
20 over the inner flap part 10, while the end is connected to a take-up shaft 17, with the towel web running on the outside along a guide plate 18 mounted in the frame part 1.

As Fig. 4 demonstrates, for opening the towel dispenser, the top cover 5 has been swivelled upwards and the bottom  
25 cover 6 has been swivelled downwards. Adjacent the outer flap part 8, a yoke 21 is mounted on the cover 5 for pivoting about a shaft 20, which yoke carries on either end thereof a further feed roller 22 for rotation. The yoke 21 is positioned so that when the top cover 5 is closed, the rollers 22 are straddled  
30 on the feed roller 16, as may appear most clearly from Fig. 5. When the top cover 5 is thus closed, the towel web 11 is clamped between the feed rollers 16 and 22, ensuring that those rollers will rotate when the towel web 11 is pulled at. Provided on the bottom cover 6 is a further take-in roller 25,  
35 mounted in a support 24 for rotation about a shaft 23. This roller 25 is positioned so that when the bottom cover 6 is closed, this roller 25 forms a slot together with the guide

plate 18. As a result, the towel web 11 is given a course as indicated by the dotted line 11a.

From the above it will be appreciated that by simply placing a roll 15 into the trough, pulling out the free end  
5 and connecting that free end to the take-up shaft 17 and closing the top cover 5 and the bottom cover 6, the fitting of a new roll is completed.

The connection to the take-up shaft 17 can be realized in a particularly simple manner when use is made of a take-up  
10 shaft as shown in Fig. 6. The shaft 17 shown in Fig. 6 is provided with a slot 26 extending over the larger part of the length of the shaft. Two ribs 27a are provided, extending in the slot, and opposite these ribs two grooves 27b are located, as may appear most clearly from Fig. 7. For connecting the  
15 towel web to the take-up shaft 17, the towel web should merely be slid into the slot 26 from aside. This sliding in from aside is hardly opposed by the ribs 27a and the grooves 27b, while wishing to pull the web from the slot 26 perpendicularly thereto calls up a great resistance. After the towel web has  
20 been slid into the slot 26, the take-up shaft 17 only needs to be inserted into its bearing in the bottom portion of the frame part 1, for which purpose the take-up shaft 17 comprises two insert ends, one of which can be inserted into a bearing support 19 capable of being swivelled away, so that after  
25 inserting the other end, swivelling the bearing support 19 in the direction of the take-up shaft 17 and inserting one end therein, the positioning of the take-up shaft 17 is completed. Pre-rolling the web some turns about the shaft can be omitted, which has the advantage that this pre-rolling cannot occur in  
30 the wrong direction either, as a result of which the towel web would be unwound again upon first use.

With reference to Fig. 5, the operation of the towel dispenser will now be specified, starting from a towel web placed in the dispenser.

35 When the towel web 11 is pulled at to form a loop as shown in Fig. 3, the feed roller will start rotating and driving a belt 29 via a belt wheel 28, which belt 29 in turn

causes the belt wheels 30, 31 and 32 to rotate, tensioning a spring motor 33. Belt wheel 31 is of double construction and drives belt wheel 35 via a belt 34. The belt wheel 35 is mounted on a shaft 36, which further carries a gear wheel 37 which is in engagement with a gear wheel 38. Located on the shaft, not shown, of the gear wheel 38 are the cam disks 39 and 40. The cam disk 39 provides the rotation of a cam arm 41 having a suction cup 42 connected thereto, which suction cup, upon rotation of the cam arm 41, is pressed against a counter member, not shown, and thus provides a generally known retarding mechanism. After one revolution, the cam disk 40 presses by its cam on the cam of a crank 43, which is rotatably connected to a belt block 44 and presses this belt block against the belt 29, so that the belt 29 is pressed against a blocking projection 45 mounted on the frame part 1 and is thus blocked.

After a certain time has passed, the suction cup 42 comes loose from its counter member, causing the cam arm 41 to slip back into its starting position and to push the crank 43 away from under the cam on the cam disk 40, whereupon the belt block 44 tilts back and the belts 29 and 34 are released again.

During rotation of the cam arm 41, a shaft 46 and a blocking catch 47 mounted thereon are rotated as well, so that a belt 48 is pressed against a blocking projection 49 mounted on the frame part 1 and is thus blocked. As a result, the spring tension built up in the spring motor 33 is blocked against unwinding.

During the formation of the loop of towel web 11 as shown in Fig. 3, not only clean towel web is drawn from the first slot 12, but also used towel web is drawn from the second slot 13 to enable pulling out a sufficient length of clean towel web in a flowing motion without taking over and without letting the towel path slip between the fingers whereby the pulling takes place, inspite of the relatively small distance between the end of the flap parts 8 and 10 and the second slot 13. When used towel web is being retracted from the second

slot 13, the take-up shaft 17 is unwound, which shaft tensions the spring motor 33 by means of gear wheels 50, 51 and 52. For that purpose, gear wheel 50 is coupled for moment transmission to the insert end of the take-up shaft 17 through a suitable  
5 construction, for instance square in cross section, of that insert end and its insert opening, while a freewheel clutch in shaft 53 provides that this can be effected inspite of the belt 48 being blocked. Also, a one-way centrifugal clutch in wheel 54 prevents the air brake 55 from being activated.

10 As soon as the pulling out of towel web 11 has been completed and this web is released for drying the hands, the take-up shaft 17 will wind up again the length of towel web 11 that was unwound. This movement is braked due to the fact that the air brake 55 starts rotating and, consequently, braking.  
15 Both the unwinding and the winding up of the take-up shaft 17 are maximized by a limiter accommodated in wheel 56.

After the above-mentioned time span has passed in the retarding mechanism, the shaft 46 being rotated again causes the blocking catch 47 to be swivelled back and the belt 48 to  
20 be released. After the removal of this blocking, the spring motor 33 will drive the take-up shaft 17, as a result of which used towel web 11 is taken in, which movement is again braked by the air brake 55 rotating along, and the towel dispenser is brought from the position shown in Fig. 3 into that of Fig. 2.

25 Each time when the cam arm 41 tilts back into its starting position and thereby rotates the shaft 46, a reset catch 57 is also tilted, causing a reset arm 58 to be pressed into the teeth of a reset wheel 59. This takes place at the same moment when the take-in movement is released upon the  
30 removal of the blocking of the belt 48. This belt causes wheel 60 to rotate, which in turn drives a belt 61 and hence belt wheel 62. The belt wheel 62 rotates relative to a reset wheel 59 that is placed on the same shaft and blocked by the reset arm 58. A cam wheel 63 between the belt wheel 62 and the reset  
35 wheel 59 provides that this rotation is limited to maximally one revolution. This limitation becomes effective when the roll 15 becomes exhausted and the winding up of the take-up

shaft 17 is no longer limited by the towel web 11 being pulled taut. Owing to this limitation, energy stored in the spring motor 33 is retained and can, after the towel dispenser has been filled with a new roll 15, directly be used again for taking in a towel loop which will be formed almost each time when a new roll is being fitted. Each time when a length of clean towel web 11 is pulled out and cam arm 41 tilts, the blocking of the reset wheel 59 is removed and a torsion spring 63 mounted between the belt wheel 62 and the cam wheel 63 each time provides the resetting of the position of the cam wheel 63 into the starting position relative to the belt wheel 62.

It is readily understood that within the framework of the invention as laid down in the appended claims many variants and modifications are possible, in particular with regard to the various constructional details and mechanisms shown in Fig. 5.

## CLAIMS

1. A towel dispenser comprising a housing with a frame part having a back plate which can be mounted on a wall, two side plates and a front plate connecting the side plates, wherein back plate, side plates and front plate give the frame part a tubular shape with open ends, and cover parts which are connectable to the frame part and which can close at least the open ends of the tubular frame part, wherein adjacent a transition between the front plate and each of the two cover parts a slot is present for letting through a towel web, said slots extending parallel to each other and being spaced apart, said housing being provided with a first space for receiving a stock of clean towel web and with a second space for receiving used towel web, wherein the towel web can extend via the first and the second slot from the first space to the second space while running, between the first space and the first slot, between a set of feed rollers, at least one of said feed rollers being coupled to a transmission mechanism which can charge an energy accumulator, such as a spring motor, which energy accumulator, controlled by a delay mechanism, can rotate a take-up shaft in the second space for taking in used towel web, and wherein means are further present for enabling used towel web to be partially retracted from the second slot and taken into it again,

characterized in that the first and the second slot are always formed between a cover part and the front plate of the frame part, that at least one of the feed rollers is mounted in the frame part and at least one other feed roller is mounted in a first cover part closing the first space, and that in the frame part a guide part is mounted and in a second cover part closing the second space a take-in roller is mounted, wherein the towel web, when being introduced into the towel dispenser, can be placed from the first space over the feed roller or feed rollers mounted in the frame part and then on the outside along the guide part, whereupon, when the first cover part is being closed, the feed rollers come to lie

relative to each other so that the towel web is held in close contact with at least one of the feed rollers which, via the energy accumulator, drives the transmission mechanism coupled to the take-up shaft, and when the second cover part is being  
5 closed, the guide part and the take-in roller form a slot through which the towel web will extend automatically.

2. A towel dispenser according to claim 1, characterized in that a set of rollers consists of a first roller and two rollers which are displaceable relative to the first roller  
10 during the opening of a cover part, which have parallel center lines and which are straddled on the first roller when said cover part is closed, so that a towel web running between the rollers is forced to be in contact with a part of the circumference of each roller.

15 3. A towel dispenser according to claim 2, characterized in that the two jointly moving rollers are mounted in a yoke having a pivot parallel to the center lines of said two rollers.

4. A towel dispenser according to any one of the preceding  
20 claims, characterized in that the cover parts are pivotally connected to the frame part, in each case by means of a pivot extending parallel to the first and second slots.

5. A towel dispenser according to any one of the preceding  
25 claims, characterized in that the take-up shaft is provided with a slot extending over at least the width of the towel web, into which slot the towel web can be slid from aside and which comprises means retaining a slid-in towel web by means of friction.

6. A towel dispenser according to any one of the preceding  
30 claims, characterized in that the take-up shaft is directly drivable by the energy accumulator to be charged by means of the feed rollers.

7. A towel dispenser according to claim 6, characterized in that the take-up shaft is at one end thereof provided with an  
35 insert journal having such a shape that through insertion, a moment-transmitting connection can be formed with an element drivable in rotation by the energy accumulator, whilst the

take-up shaft is at its other end provided with an insert journal which can be inserted into a bearing that can be swivelled or pulled away.

8. A towel dispenser according to any one of the preceding  
5 claims, characterized in that a flap is provided connecting to  
the first slot and pivotable adjacent that first slot, said  
flap comprising a first part connected to the first cover part  
and a second part connected to the frame part, whilst the  
towel web can extend between the two flap parts and the first  
10 flap part can be coupled to the second flap part, and the  
second flap part is pressed into an inclined swivelled-out  
position by a spring force, said spring force being less than  
the force generated by the energy accumulator driving the  
take-up shaft.

15 9. A towel dispenser according to claim 8, characterized in  
that the coupling between the two flap parts takes place by  
means of a magnetic force, a spring force or gravity.

10. A towel dispenser according to claim 8, characterized in  
that the first flap part is pressed, by spring force, in the  
20 direction of the other flap part, said spring force being less  
than the spring force which tries to cause the second flap  
part to swivel out.

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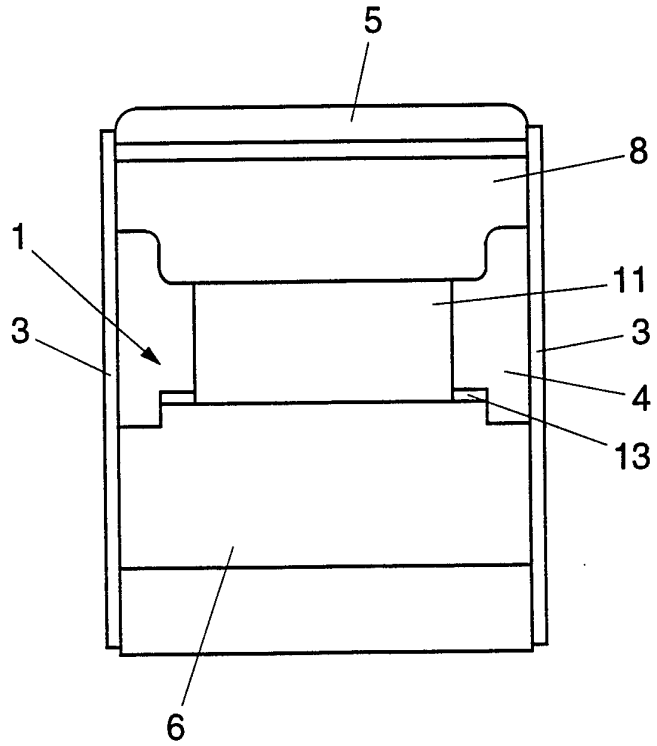


FIG. 1

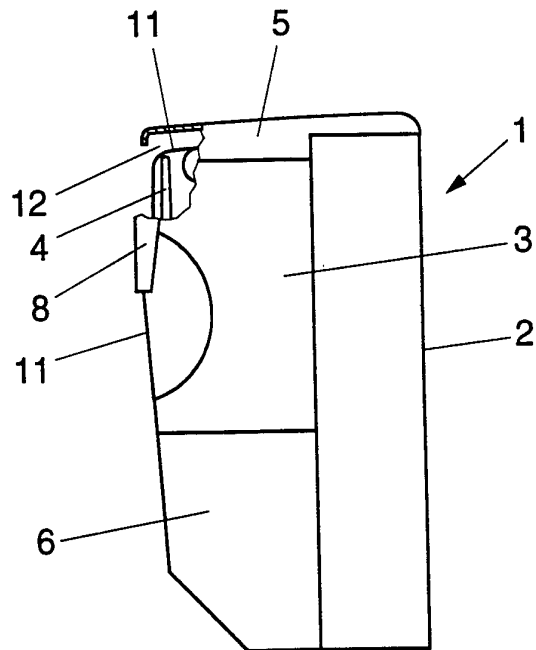


FIG. 2



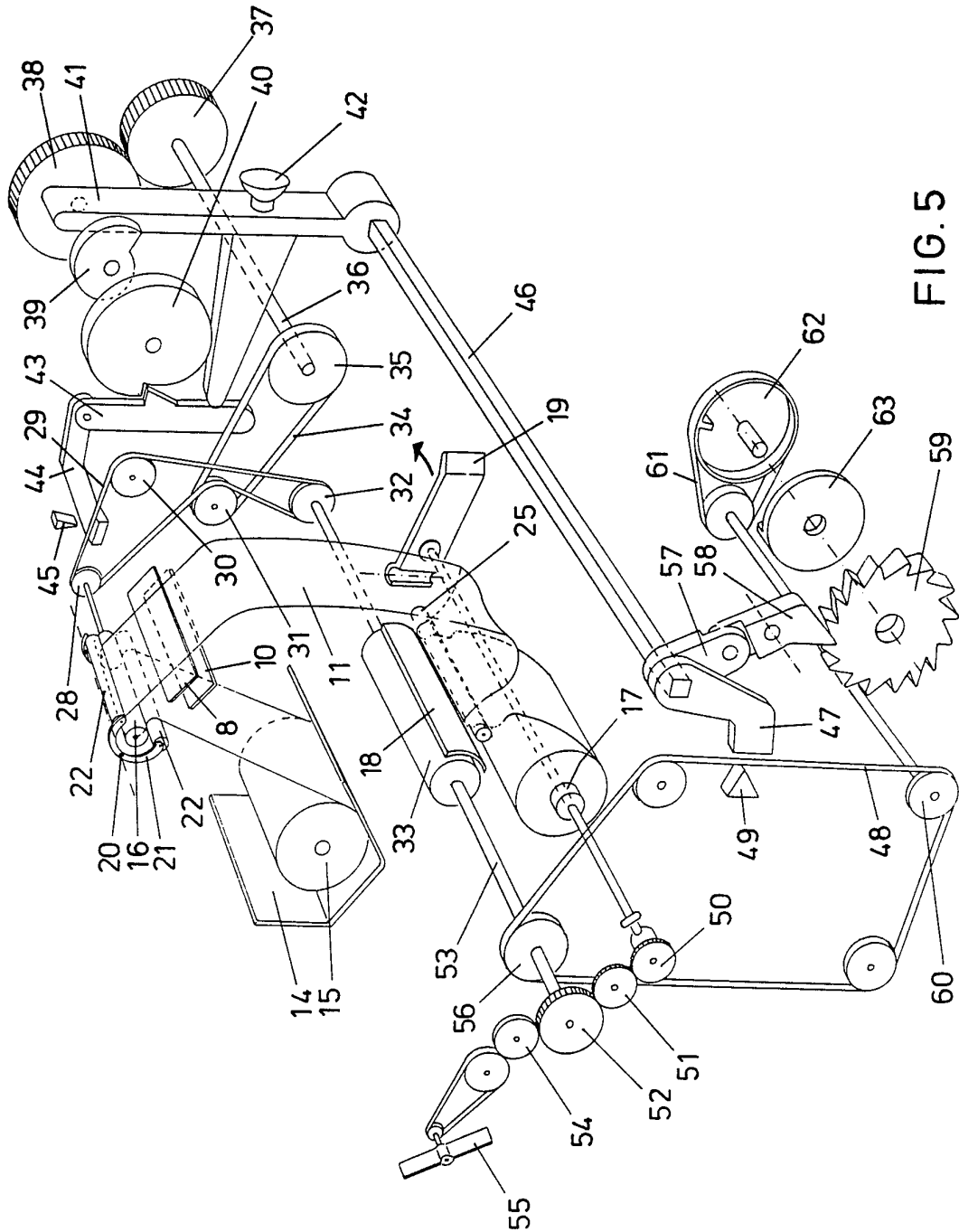


FIG. 5

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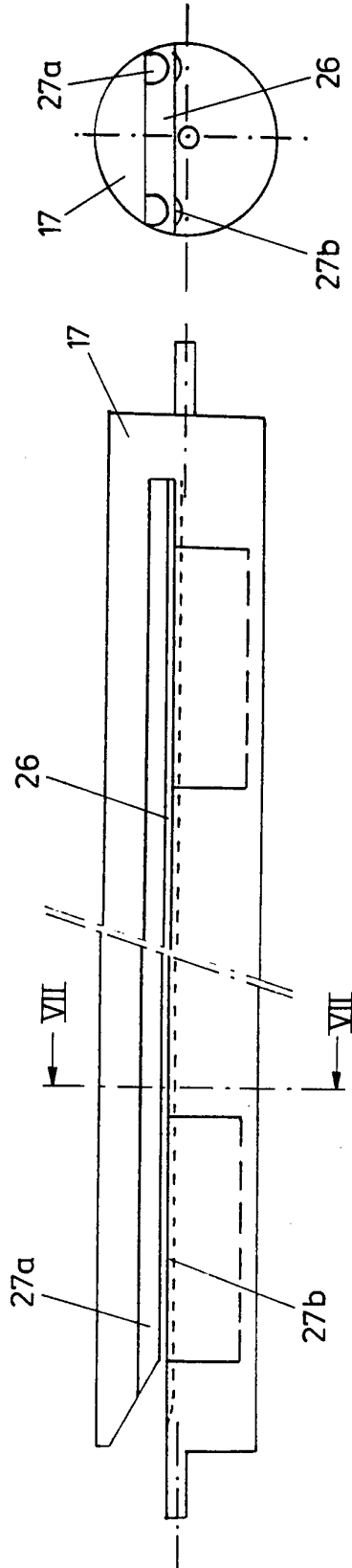


FIG. 7

FIG. 6

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/NL 96/00224

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 A47K10/28

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A47K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A,3 574 431 (HENDERSON CHARLES A) 13 April 1971 see column 1, line 70 - column 3, line 69 see figures 1-4	1,4,6
A	---	
A	EP,A,0 283 554 (CWS AG) 28 September 1988 see column 2, line 37 - column 4, line 15 see figures 1,2	1,3,4,6
A	---	
A	US,A,3 506 320 (HOWLETT EDWARD JOHN) 14 April 1970 see column 2, line 29 - line 70 see column 3, line 23 - line 65 see figures 1,2	1,4,6,8
	---	
	-/--	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

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- \*&\* document member of the same patent family

Date of the actual completion of the international search

24 October 1996

Date of mailing of the international search report

25. 10. 96

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Authorized officer  
  
Vrugt, S

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/NL 96/00224

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP,A,0 309 208 (WELLCOME FOUND) 29 March 1989 cited in the application see column 2, line 9 - column 3, line 22 see figures 1-5 <p style="text-align: center;">-----</p>	1

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No <b>PCT/NL 96/00224</b>
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		CN-B- 1023062	15-12-93
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